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THE PANAMA CANAL REVIEW

X
986.3005
P187

FEBRUARY 1969

W. P. Leber, Governor-President

R. S. Hartline, Lieutenant-Governor

Frank A. Baldwin
Panama Canal Information Officer

PANAMA CANAL REVIEW

Official Panama Canal Publication
Published quarterly at Balboa Heights, C.Z.

Morgan E. Goodwin, Press Officer
Publications Editors
Louis R. Granger, Tomas A. Cupas
News Writers
Eunice Richard, Tobi Bittel, Fannie P. Hernandez, Jose T. Tuñon, and Luis C. Noli

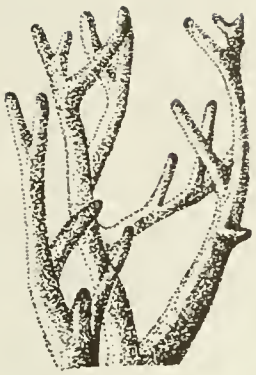
Printed at the Printing Plant, La Boca, C.Z.
Review articles may be reprinted in full or part without further clearance. Credit to the Review will be appreciated.
Distributed free of charge to all Panama Canal Employees.
Subscriptions, $1 a year; airmail $2 a year; mail and back copies (regular mail), 25 cents each.
Postal money orders made payable to the Panama Canal Company should be mailed to Box M, Balboa Heights, C.Z.
Editorial Offices are located in the Administration Building, Balboa Heights, C.Z.

University of Florida 1853

Fishing for Coral

A yellow grunt searches for food in a bed of brain coral and fire coral. Thousands of fish inhabit the stone-like formations in the sea.

CORAL LURES THEM UNDER THE SEAS



A TROPICAL sun cast golden shadows on the gentle rolling waves as the swimmer suddenly broke the surface of the clear, placid sea off a small island of the San Blas Archipelago in the Caribbean. Triumphant, she held up a greyish lettuce-like stony formation she had robbed from the fringing coral reef. Carefully, she placed it in the boat beside the machete she had used to pry loose the flower-like coral from its parent attached to the rockhard reef.

The swimmer, wearing mask and snorkel, fins and sturdy gloves, calls herself a timid member of the Canal Zone diving family. She is petite and comely Mrs. Lois Harrison, Clerk of Court, U.S. District Court. She had just acquired another specimen to add to her already spectacular collection of corals, perhaps the most beautiful of tropical sea animals.

Mrs. Harrison, Mr. and Mrs. Anthony Mann, well-known divers and skilled underwater photographers, Mr. and Mrs. Ted Williams and geologist Robert Stewart, one of the first coral collectors, are among the Canal Zone residents who

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Cover Story

OUR COVER shows a collection of treasures of the marine world, most of which are found in the waters that bathe the Isthmus. Decorative, graceful, lacy seafans, lettuce coral, staghorns, and fire coral, exquisite stone-like blooms from the coral gardens on the fringing reefs found locally in the warm waters of the Atlantic and Pacific Oceans, dominate the display.

Like porcelain sculpted by the expert hand of nature, the sea shells' delicate colors and variety of shapes and designs add to the grandeur found in the sea. The conchs shown are abundant in the area. Frequently, rare specimens are found by coral divers in the crevices of coral beds. The spiral shaped chambered nautilis is a native of South Pacific waters and belongs to U.S. District Judge Guthrie F. Crowe.

A crystal clear fishnet float, sea urchins, starfish, sea horses, and beautifully barnacled old bottles, not usually denizens of the sea, complete the composition which is actually table-top photography created by Cleve Soper, chief of the Laboratory Section of the Panama Canal Graphic Branch.

Photographers may be interested to know that the photograph was taken with a 4 x 5 Super Graphic on Ektachrome Film, type B, using 2 color corrected 3200 K lamps. The exposure was 3 seconds at f.5.6.

The display is part of a collection of marine life owned by Mrs. Lois Harrison, Clerk of Court, Ancon District.

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Brain coral and staghorns with a background of gorgonian shown here are all common corals found in Isthmian waters.

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have been attracted by the two oceans that bathe the Isthmus.

On weekends, these divers head for the coral reefs in the areas of San Blas, Bocas del Toro, Las Perlas, Taboga Island, and near Fort Sherman to pursue their hobby. Skin diving or snorkeling, they explore the grandeur of the world below the sun-washed seas off the coasts of Panama. These diving excursions have yielded scores of shells, sea horses, starfish, a multitude of fishes and a myriad of marine crustaceans as fragile and beautiful as old porcelain, and a variety of corals of breathtaking beauty.

From time to time they come up with unusual objects—large green glass fishing floats that have broken loose from Japanese fishing nets in the Pacific or small multicolored ones that have slipped Portuguese nets in the Atlantic, a case of crystal champagne glasses (most of them in perfect condition), exquisitely barnacled hand-blown bottles, and other articles which may have come from the remains of Morgan's pirating ships. But it is corals that beckon them.

The Ocean's Treasures

Corals, which are living animals and not plants as many would believe, belong to the most primitive of multicellular and tissue-carrying creatures. They live in warm moving waters which bring them food. The algae living in the coral beds supply them oxygen.

A living coral is a colony of simple animals called polyps. The skin covering the lower part of the polyp forms into a stony layer much as the shell grown by an oyster. The animals build skeletons around themselves, producing new polyps. The skeleton of the polyp is built by cells that extract calcium carbonate from the sea and deposit it as limestone, building from the bottom upward. As the polyps grow, they construct their own limestone partitions, multiplying and forming branches up and out, or growing sideways into lobes and eventually flower-shaped, or rounded as in the case of the brain coral. Polyps grow in complex ways forming corals that vary greatly in appearance and nature.

Corals forming living reefs must have sunlight and they grow beautifully within 90 feet of the surface. They are not found below 150 feet where light is too weak to reach them. Low temperatures also kill corals. Though corals are found in all the world's oceans, coral reefs exist only in tropical waters.

Reef corals are divided into a great number of different species, divisions and sub-divisions. There are soft corals, like the graceful seafans and seawhips. Seafans have the shape of a large lace-like leaf, consisting of numerous short branches interlaced and fused together to form a filigree network. They may be lavender, blue, or yellowish in color. The seawhip has skeletal arched branches whose surface is covered with polyps that are barely visible. These may reach enormous heights, forming a virtual jungle in the sea.

One specie known as the "black coral of the Caribbean area," usually found in depths below 100 meters, according to an expert of the Smithsonian Institution, has been discovered by skin divers

in the Atlantic near Cristobal at a depth of 70 feet.

The hard corals include varieties such as the finger coral, like stubby fingers; leaf coral; staghorns and elkhorns, so named because they resemble antlers: star coral, closed up tight during the day with its polyps opening up at night; and brain coral, which gets its name from its amazing resemblance to the surface of the human brain.

Each species has within its polyp the inherent ability to develop in a given manner.

Isthmian divers collect corals at

Resembling a flower burst, a spiny sea worm nestles in a cluster of finger coral. Sea worms are among most common of marine organisms found near coral.

depths from a few feet to approximately 40 feet from the surface, encountering greater growths on the landward side of the outer reef. More varieties are found in the quieter lagoons behind the reef.

Large coral reefs found on the Atlantic side of the Isthmus are the result of a small tidal variation and a nearly constant high water temperature. On the Pacific side, the growth of reef-type corals is inhibited because of the yearly upwelling of the water in the bay that brings cold deep water to the surface, and the high tide differential.

Solitary-type corals, much more resistant to cold water, are abundant in the Pacific. Geologist diver Robert

Canal Zone divers select coral specimens.

Stewart has found at least five types of these solitary corals attached to lock gates at Miraflores Locks. He has labeled more than 40 species of coral from the Atlantic—many of which are not described in scientific literature and half as many from the Pacific Ocean. Among his favorites is a beautiful magenta coral found only in the inside of the mouth of caves or on coral overhangs. Stewart has given a large coral collection to the La Salle High School Museum in Panama City.

Petrified corals, which are prized by the local rockhounds for making jewelry, book ends and table tops may be found in such areas as Rio Gatuncillo, Madden Lake, Farfan beach, Monte Lirio, Nuevo San Juan (near Cemento

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Stone-white jewels from the gardens in the sea are these staghorns, fire corals and Atlantic and Pacific finger corals brought up from the deep by Mrs. Lois Harrison holding sea urchins.

Band commander Cadet Lt. Alfred L. Huish III, leads the ROTC band during "sound off" at the New Year Review.

CANAL ZONE ROTC BUILDS OUTSTANDING TRADITION

A TRADITION of outstanding performance already marks the Reserve Officers Training Corps (ROTC) program in the U.S. high schools in the Canal Zone.

Now in its 20th year, the Balboa High School ROTC Unit has won the Honor Unit designation awarded by the Department of the Army for 19 consecutive years. The Cristobal High School Unit, which is in its 18th year, has failed to win it only once—and that because its enrollment was under the required minimum strength of 100 cadets.

Inspection

The Honor Unit designation is not easy to attain. It is awarded on the basis of a full-fledged inspection carried out by a U.S. Army team of officers and noncommissioned officers who specialize in inspecting regular military units. It covers students' records, training schedules and equipment, and an inspection of the cadets, usually by the Commanding General of U.S. Army Forces Southern Command.

Behind the record of the two Canal Zone ROTC Units—outstanding among all—is a spirit of competition and achievement that has been passed from class to class, something akin to the tradition that inspires cadets at the U.S. Military Academy, according to Maj. Hugh M. Fisher, U.S. Army, professor of military science in the Canal Zone Schools.

That spirit has been fostered by the ROTC program itself for the cadets advance only by volunteering or by competing. Joining the ROTC is voluntary—it's a regular elective course with one credit per semester—but the cadet-to-be has to meet age and physical standards set by the Army. Promotion is competitive, and even in the cases where ranks have to be filled by appointment (particularly at the start of the school year), the cadets keep them only if they stay at the top of their respective groups.

Two Flags

A good example of the extent to which competition pervades ROTC activities is the daily raising and lowering of the Panamanian and U.S. flags displayed in front of the two schools. This is a very rigid and formal ceremony conducted by a uniformed cadet guard detail of six privates and one commander immediately before the start of classes and just after the school-day ends. Two battalion staff officers—the duty officer and his assistant—observe the ceremony and grade the detail performing it. The guard details are assigned from the company which has the duty for the week. The grades are posted and the detail with the highest score wins the Honor Guard Ribbon.

Basic Goal

The ROTC record in the Canal Zone is all the more impressive because the student cadets run themselves, so to speak. True, a cadre of two officers and five noncommissioned officers of the U.S. Army provides instruction and guidance and reviews important decisions. But the initiative is left largely in the hands of the cadets, for a basic goal of the program is character building. The student cadets themselves solve their problems of personnel, of

organization, of conduct, and of planning. Thus the leaders emerge.

Established at the request of the Schools Division, the ROTC program began at Balboa High School in 1948. It proved so successful, that 2 years later it was extended to Cristobal High School.

Each unit constitutes a battalion, the 1st at Balboa with 353 cadets and the 2d at Cristobal with 115. The respective strengths of the two battalions are in proportion to the total enrollment at each school and represent over 50 percent of the total number of eligible boys.

Incidentally, both battalions have tuition students, including non-U.S. citizens in their ranks—31 at Balboa and 11 at Cristobal. And at times special education students have been accepted as cadets and have benefited greatly from the program.

Merits, Demerits

With its larger strength, the 1st Battalion is organized into four companies, as compared with two for the 2d Battalion. Each battalion has its own command and staff. The Army instructors grade the cadets in class and inspection, assisted by the cadet chain of command. The grading for drill performance and the merit-demerit system are administered by the cadet noncommissioned and commissioned officers. Merits or demerits can affect a cadet's final mark by one letter grade in either direction. The system includes a review board to hear appeals.

As a regular course, ROTC training—which is offered for 3 years—has a weekly schedule of one period every day devoted to drilling, instruction in basic military subjects, physical training, or to inspection (every Friday). As with any other course, there are quizzes and examinations.

Special Training

A unique feature of the ROTC program in the Canal Zone is the availability of training facilities of all the components of the U.S. Southern Command. Such opportunity is not generally available to ROTC units in the United States. Canal Zone cadets, for example, have received tactical training at the U.S. Army's camp at Rio Hato, in Panama; have gone through a shortened course at the Jungle Operations Training Center, and have attended orientation sessions at the Parachute Jump School.

The support provided by the U.S. Armed Forces to the ROTC program in the Canal Zone has played an important part in making it strong and active over the years.

Balboa High School ROTC cadet S/Sgt. Ronald Romo cleans his rifle making sure the job is done to perfection.

Incidentally, not too many ROTC units—even in the United States—have the distinction of being reviewed by a four-star general as have the Canal Zone units.

The reviews—there are four of them in the school year—provide the cadets with the opportunity of showing themselves in public in full splendor. At two of these, in December and in March, the two battalions participate jointly as a brigade. Highlight of the December review is the presentation of the Army and Navy Legion of Valor—the highest award that can be earned in the ROTC program. The award is sponsored by the Army and Navy Legion of Valor of the United States, Inc., an organization composed of winners of the Congressional Medal of Honor and the Distinguished Service Cross. A U.S. Army board selects the winner from among the two Canal Zone battalions.

Field Night

The March review is the annual Field Night, which is the climax of the competitive phase. It features competition at all levels—individual, squad, platoon, company and, the most impressive of all, the head-on contest between the two battalions' drill teams.

The teams, one in each battalion, actually are separate companies made up of successful volunteers from the leadership school conducted in late July. Sixteen cadets are chosen for the marching drills and are backed up by eight to ten alternates. The drill team

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Cadet Pfc. Eric Runnestrand, representing the newly organized Balboa High School ROTC Theodore Roosevelt Cavalry Troop (Rough Riders), demonstrates a jump for Maj. Hugh M. Fisher, PMS, left, and Maj. Gen. Chester L. Johnson, at the New Year Review.

Maj. Gen. Chester L. Johnson congratulates Cadet S/Sgt. Brett Patton, outstanding NCO for the first semester, during the New Year Review. From left beside Patton are: Cadet S/Sgt. Gregory Gillis, outstanding NCO for the second 9 weeks; Cadet Cpl. Edwin Murdock, outstanding first year cadet for second 9 weeks; Cadet S/Sgt. Harland V. Howard III, squad leader of the Honor Guard Squad for the second 9 weeks. At extreme left is Cadet Sgt. Maj. Donald St. John. Maj. Hugh M. Fisher, PMS for Canal Zone Schools, is standing next to General Johnson.

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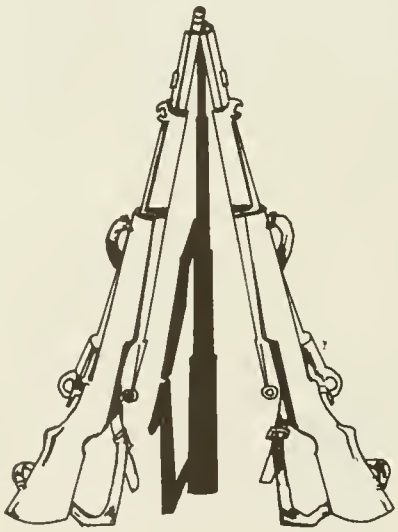
members average some 12 hours of extra practice every week to sharpen their spectacular precision marching.

This is the night also when the drill teams, the pretty battalion and company sponsors and the band and its majorettes shine.

There is a girl sponsor for each battalion and each company. They are chosen by vote by the second-year cadets from among volunteers for service in the following school year. Their duties are not limited to strutting in reviews, for they handle all the secretarial duties of their respective outfits throughout the school year—and are graded on it.

Cadet Band

Only the 1st Battalion has its own band—understandably so because of its large strength. A cadet with experience in instrument playing is automatically assigned to the band, which has an authorized strength of 28 members. The Balboa High School ROTC band plays at battalion and brigade reviews. The cadet musicians practice during the drill and physical training periods, held for the rest of the cadets, but are required to pass inspection on Fridays.



Not too long ago, the cadet band filled in for the 79th U.S. Army Band at a graduation ceremony at the U.S. Army Forces Southern Command's Noncommissioned Officers Academy. It also has serenaded the Governor of the Canal Zone and the U.S. Southern Command component commanders on special occasions. Last Christmas it provided a surprise carol concert at the Governor's reception.

Cavalry

The Balboa battalion has added something new—a cavalry troop which still is in the training stage. Composed of five cadets and their mounts, it has been designated appropriately the Theodore Roosevelt Cavalry Troop

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Say it in Spanish!

HAS IT EVER occurred to you why so many Americans in the Canal Zone are able to converse in Spanish?

One of the main reasons is the Spoken Spanish Program carried on within the Panama Canal organization by the Personnel Bureau. It is set up to guide the student from a basic course through intermediate and advanced stages utilizing a streamlined method of language instruction developed by one of the instructors.

The student is able to assimilate a greater quantity of instruction in a shorter period of time, as his progress is noted throughout all phases of the program. Assurance is made that he has grasped the mechanics of the language while developing basic vocabulary, along with personal confidence in his ability to carry on a conversation in Spanish.

Started in 1957

The program was started in 1957 by the then Gov. William E. Potter and Panama Canal Personnel Director Edward A. Doolan. Doolan has taken an active interest in developing the program over the years, from its modest beginning as an eight-member class to its present level of some 100 students. These make up several classes daily.

When the Spoken Spanish Program was initiated, the original class consisted of key executive personnel whose positions required frequent contact with persons who spoke little or no English. It was taught by Carlos García de Paredes, who today is chief of the Spanish language program. Among the members of his first class were Governor Potter and Paul Runnestrand, Executive Secretary of the Canal Zone. Through the years, as the success of the program became more evident, it was expanded to include middle management and top supervisory personnel. The curriculum is patterned after the "guided imitation" method developed by the Foreign Service Institute of the Department of State in 1953. The use of textbooks is minimized and the student must rely on acquiring knowledge through the use of sound patterns by imitating the spoken words of the instructor.

The differences in the sounds of certain letters is pointed out by Carlos García de Paredes, who has been instructing in the Spoken Spanish Program since its inception in 1957.

"By-Ear" System

This method was recently modified by García de Paredes. He compares the change to the "by-ear" system of teaching music: "In music, a student who learns to play an instrument by reading notes can later develop his skill so he can play any sheet music but usually he cannot adapt to playing by ear. With my modification of the FSI language training program, the student learns Spanish through association of sounds, along with basic oral skills, in much the same way that an aspiring musician may learn to play an instrument by ear," he says.

This student, although unable to read music, can later develop his musical ability to a degree whereby he is able to play almost any composition by ear alone. Similarly, the language student is better able to adapt and is much more flexible in this "by ear" method of learning than the student who has learned strictly by reading.

On the Pacific side, classes are held at the Administration Building, the Training Center, and Gorgas Hospital. On the Atlantic side they are conducted at the Industrial Division and the Civil Affairs Room. Assisting full-time instructors Carlos García de Paredes and Mrs. Frances Enyart at Balboa, and Rolando Linares at Cristobal, are part-time instructors Antonio Linares (Balboa) and Dolores Suarez (Cristobal).

Three Categories

The Spoken Spanish Program is divided into three categories, depending on several factors, the need for Spanish-on-the-job being foremost. The level of training for each student depends on his progress in the program. The categories are Spoken Spanish Management Trainee Program, Special Groups (for those requiring Spanish for job utilization, such as hospital interns and residents, admeasurers, and policemen) and Special Management Program.

In the Special Groups category, hospital personnel participate in a program

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The Accent's on Spanish

(Continued from p. 9)

which early in the course introduces medical terms used in day-to-day contact with Spanish speaking patients. Phrases such as, "Where does it hurt?" and "How long have you been feeling this way?" would be some of their first phrases.

The third category, Special Management Program, is designed for key personnel. This course, in three phases, allows the student to train quite rapidly while losing little of the basic knowledge acquired in the preliminary stages of instruction. Students begin with a preparatory course of about 3 weeks duration in which they receive personal instruction in Spanish. English is spoken only when necessary in this first phase of training.

Phase II

Phase II consists of a 2-week total immersion course in Spoken Spanish at the Berlitz School in Guadalajara, Mexico. There, the student is lectured throughout the day by several instructors, in Spanish only. He must order his meals, ask directions and, even after school is out, rely on his knowledge of conversational Spanish to see him through the 2-week stay in that city.

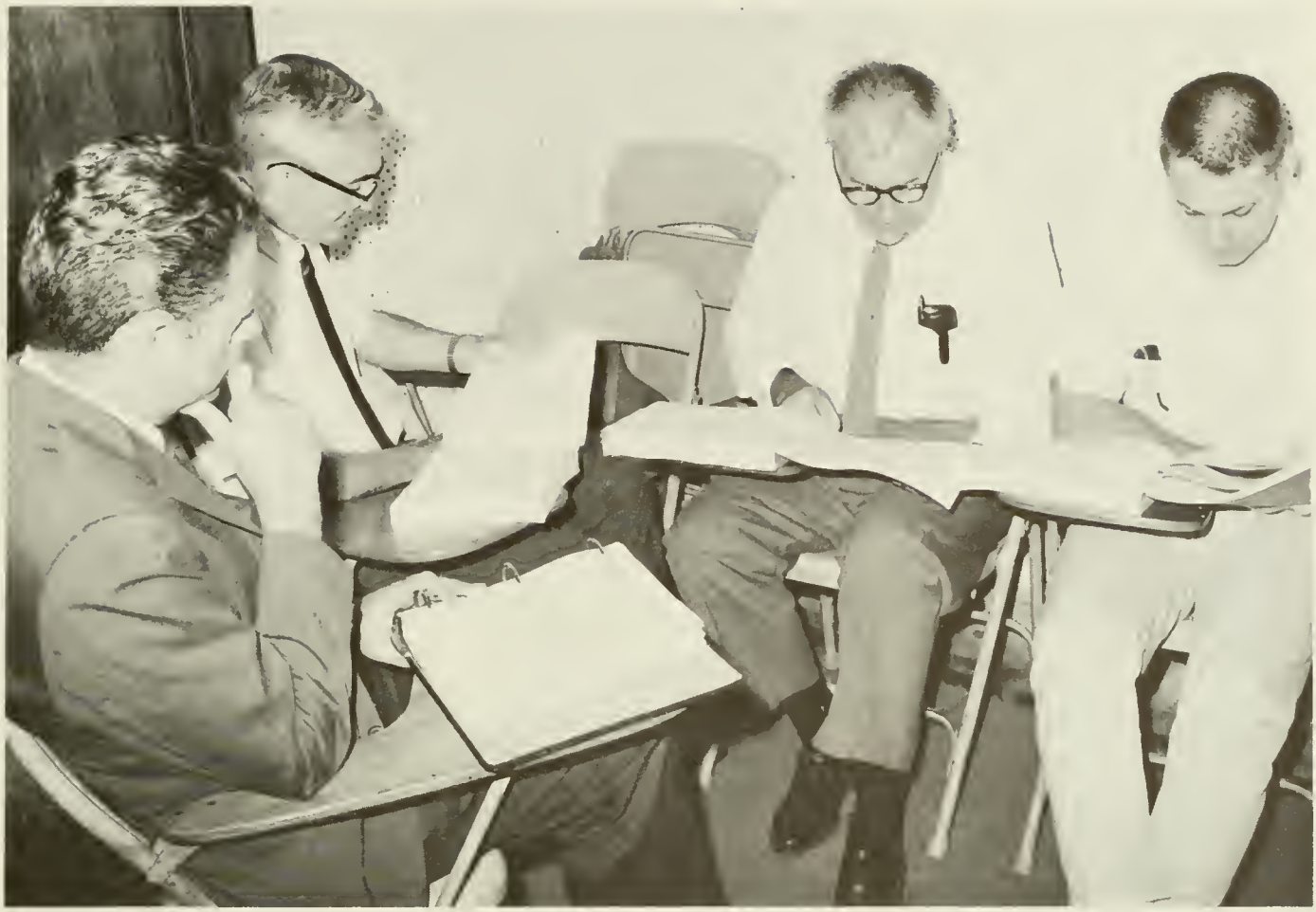
The Guadalajara school has a definite advantage over similar schools in the United States, since in Miami, New York or Washington the student would revert to English to get along when he was out of school for the day. In Mexico, it becomes a case of sink or swim. Happily, PanCanal students have been able to swim and quite well at that.

Phase III

Upon returning to the Isthmus, Phase III begins—consisting of a follow-up refresher course in which the instructor evaluates the degree of proficiency attained by the student and polishes up any rough edges in the latter's conversation. Thereafter, the student continues to receive further advanced instruction until the desired degree of fluency is attained.

The Special Management Program is limited because of the great expense involved. Expense, however, is one of the few limiting factors. Rank is not always a determinant in whether or not an employee receives training in a particular category. The needs of the employee for language capability in job utilization, and the particular level of proficiency of each student deter-

Illustrating a point in pronunciation is Mrs. Frances Enyart, instructor in the Spanish language program at Balboa Heights. The students are, left to right, Carroll B. Robertson and Willard Percy.



Recitations are an important part of learning any language. Here instructor García de Paredes listens as Paul Ficzeri, 2d from right, recites from a lesson. Other students are, left to right, Henry Makibbin and Larry Corrigan.

mine where he will be placed. In addition, personnel from each of the three categories form some groups in order to utilize more effectively available vacancies in each class.

Largest Group

The largest single group of employees enrolled in the Spoken Spanish Program is in the Management Trainee Program, designed primarily for middle management personnel and employees who have direct contact with employees on the job who speak little or no English. English-speaking personnel unable to attend day classes, because of job requirements such as shift-work, are encouraged to take evening courses at the Canal Zone College or the Florida State University Extension Branch under the Personnel Bureau's Tuition Refund Plan for Job-Related Courses.

A large number of those eligible for this training take advantage of it and acquire a working knowledge of Spanish. Similarly, Spanish-speaking personnel in this category who obviously do not need Spanish instruction, take advantage of the Tuition Refund Plan and enroll in English courses at local institutions of higher learning.

Spanish is taught also in the Canal Zone's U.S. grade schools and high schools.

Bilingualism Increase

Thus, bilingualism in normal operations of PanCanal is on the increase. An awareness of the need for better communication, foreseen by top management, is what led to the start of the program. It undoubtedly has been one of the most rewarding for employees in the Canal organization. During the almost 11 years since it was started, more than 1,500 Canal employees requiring Spanish in their jobs and all of the organization's key management personnel have been exposed to this program—with gratifying results.

Classes meet for an hour, 5 days a week, on both sides of the Isthmus, and the original 3-year course of instruction has been modified to cover the same material in 1 year. This modification has increased the effectiveness and reduced the overall cost of the program in terms of man-hours. Also, it has stimulated greater interest in the program on the part of the students.

Program A Success

Perhaps the best yardstick for measuring the success of the program is contained in the words of one of the students currently enrolled in the Spoken Spanish Program, who says:

"Now that I can get along in Spanish, I've found many things I can do with my friends in Panama that I was too shy to attempt when I couldn't communicate very well with them. Being able to carry on a conversation has opened many doors for me, and permitted me to participate in several activities I greatly enjoy. And what I consider to be the greatest compliment paid me occurred recently at a party when I was introduced to a fellow, who, immediately started talking to me in English. My friends laughed, and told him. 'Don't talk to him in English. He speaks better Spanish than you do.' "

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(On the basis of total Federal Service)

40

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Wilfred A. Alleyne
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Fitzgerald Holder
Helper Machinist (Marine)
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Edward A. Cole
Towing Locomotive Operator (Locks-Limited)
Andrew Jackson
Seaman

30

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Electrician (Lineman)
Joseph A. Husband
Leader Carpenter
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Laborer (Heavy)
Wesley H. Bailey
Lead Foreman Pipefitter
Charles S. Howe
Construction and Maintenance Superintendent
Lionel A. Perry
Leader Seaman
Emelio Archbold
Oiler (Floating Plant)
Elbert A. Belgrave
Helper Armature Winder
Elwin C. W. Conliffe
Seaman
Isaac D. Clinton
Painter
Joslyn C. Duncan
Leader Painter
Albert T. Smith
Boiler Tender
Lubin L. Theresia
Carpenter

(See p. 23)

ANCIENT ABACUS IS KEY TO MODERN MATH

MAN-MADE SATELLITES are rocketing into space, carrying astronauts beyond the earth and to the moon—in large measure because of mathematics.

We live in a mathematized culture today. There are uses for mathematics that were unheard of or even thought possible a few year ago.

Chemists and physicists have found new uses and interpretations for mathematics; biologists are applying mathematics to the study of genetics; businessmen are using mathematics to project production and sales.

Today's technological advances have opened up numerous opportunities for the girl or boy with mathematical ability. Today's children talk about sets, the binary number system, structural patterns and inverse operations—all part of the mathematics taught in their schools.

It's different, indeed, from the memorizations their parents knew.

But even with all this modernity, an ancient device known as the abacus, that was familiar to school children in Rome 1,500 year ago, is becoming well-known to Canal Zone sixth graders. It has returned to use in today's classroom.

Described as one of the first "digital computers," the abacus is a simple instrument for performing rapid arithmetical calculation. It consists of an oblong wooden frame or board holding a number of vertically arranged rods on which wooden beads, balls, or counters slide up and down. A beam running across the board divides the rods into two sections: upper and lower.

The imperfect numerical notation and the scarcity of suitable writing materials in ancient times are presumed to have given rise to the need of devices of mechanical calculation. The first abacus probably was a slab or board on which a Babylonian spread sand so he could trace letters. The word is believed derived from the Phoenician "abak" describing sand strewn on a surface for writing. As the abacus came to be used solely for counting and computing, its form was changed and improved. Wax-covered boards were introduced, and later a counter abacus was devised in which loose counters of bone, glass or metallic disks or rods were placed on a ruled table drawn on the board.

There are several references to the abacus in Roman literature. Cicero speaks of the counters as aera (bronzes) but the common name was calculi-pebbles—or abaculi.

Fifteen hundred years ago, when little Caius of Rome was learning to add: CCL VII and CCCL XIX (257+369) he drew lines on a bronze or wood board. Grooves were cut in the board and small round pebbles, or *calculi*, were placed in these grooves to represent units, 10's and so on to get his answer: DC XXVI (626).

At the same time, in another part of the world, a Chinese boy was employing a similar system, but instead of pebbles he used rods of bamboo. More than a thousand years after bamboo rods were used, the Chinese adopted the old Roman idea of having the *calculi* fastened to an abacus, known in China as *suan pan*. The rod-and-bead variety of abacus, is in use in schools, banks and shops throughout China to this day. A dividing bar separates sets of two beads and five beads on each bar. Each bead above the bar has associated with it a value five times that of the bead below the bar on the same rod. The active position for the beads is toward the dividing bar.

Some 300 years ago, the Japanese improved on the Chinese abacus and this instrument, known as the *soroban*, is still in use in modern Japan. The *soroban*

(See p. 14)

A member of the sixth generation in his family to use the abacus, W. T. Lum of Casa Lum in Panama City says he finds the instrument practical for business use. "There's no need for paper, pens, or pencils. And there's no breakage or maintenance expense," he says. As nimble and effortless as the fingers of a pianist, his fingers swiftly fly over the beads of the abacus as he tackles adding, subtracting or dividing problems. Great-great-great grandson of a Viceroy of China, he has been a resident of Panama since 1906.

ABACUS

(Continued from p. 13)

is very similar to the Chinese abacus except that instead of five-two bead arrangement on each rod, the Japanese model is generally of the four-one or five-one bead arrangement.

About 400 years ago Robert Record was born in England. When he went to school he was taught to use Roman numerals, and added, subtracted, multiplied, and divided numbers very much as Caius had learned to compute with the aid of *calculi* about 1,500 years earlier. Two important changes had been made in that length of time. Instead of having places on the computing table for only units, 10's, 100's, and so on, the spaces between the lines were used for 5's, 50's, 500's and similarly for all other 5's, and the lines were now horizontal. These changes came in what are called the Dark Ages.

Record wrote several books to influence the English people to give up the Roman numerals.

An expert in the use of the abacus can compute with speed and accuracy that compares favorably with results obtained by an experienced operator of an electric calculating machine. This fact was proved in numerous tests and is well-documented by Takashi Kojima, author of *The Japanese Abacus, Its Use and Theory.*

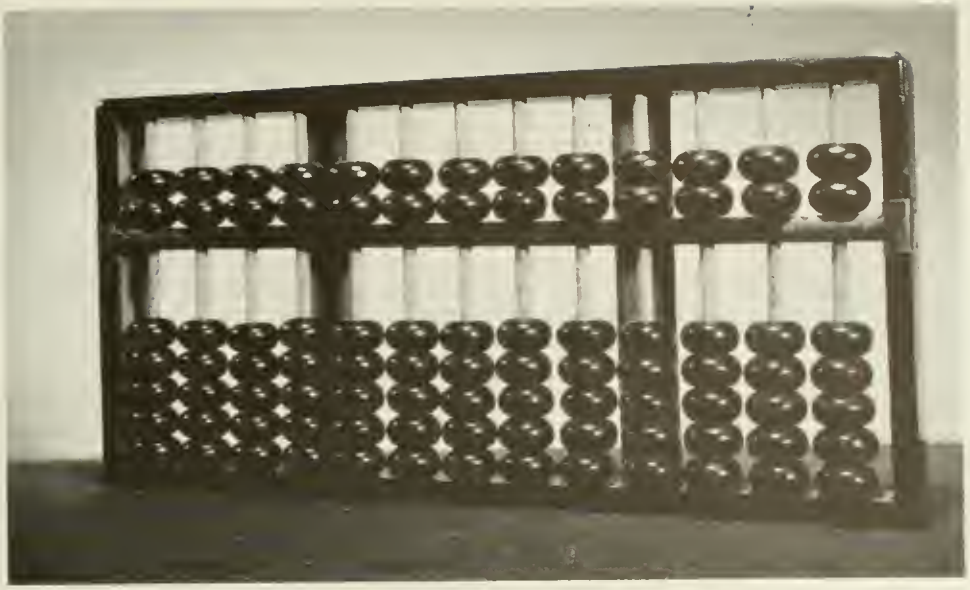
An interesting contest between the Japanese abacus and the electric calculating machine was held in Tokyo on November 12, 1946, under the sponsorship of the U.S. Army newspaper *The Stars and Stripes,* which remarked: "The machine age took a step backward yesterday at the Ernie Pyle Theatre as the abacus, centuries old, dealt defeat to the most up-to-date electric machine now being used by the U.S. Government . . . the abacus victory was decisive."

The *Nippon Times* reported the contest as follows: "Civilization, on the threshold of the atomic age, tottered Monday afternoon as the 2,000-year-old abacus beat the electric calculating machine in adding, subtracting, dividing, and a problem including all three with multiplication thrown in, according to the United Press. Only in multiplication did the machine triumph. . . ."

The abacus is generally associated with the Orient. Actually, the abacus in one form or another was used

Discovering patterns is a key activity in a modern program of arithmetic. The value of a symbol depends on the place it occupies, says Don K. Miskovsky of the Diablo Elementary School faculty, who finds the abacus helpful in developing Sixth Graders' concept of place value. At left is Jeff Fiser, son of Major and Mrs. John Fiser of Albrook and at right is Shawn Daniell, son of Senior M/Sgt. William James Daniell of Howard Air Force Base.

A mathematical race between abacus-wielding Joby Vanya, left, and Janet Howard at the blackboard was easily won by Joby. Both girls are pupils in the Sixth Grade at Diablo Elementary School. Joby is the daughter of Lt. Col. and Mrs. Joseph J. Vanya of Albrook. Janet's parents are Col. and Mrs. Hubert C. Howard of Fort Amador.



THE WINNER

throughout Europe and Asia until people came to know and accepted the Hindu-Arabic system of 9 figures and zero and associated methods of computation. The abacus was last generally used in Spain and Italy in the 15th century, in France in the 16th century, and in England and Germany in the 17th century.

Changes didn't take place rapidly. There were those who favored the use of other systems of numeration and the use of the abacus in computation. These were called the "abacists." Opposed to these were the advocates of the Hindu-Arabic system with its algorithms, or procedures, for computations. They were called the "algorists." The algorists campaigned for approximately 500 years to gain general acceptance of techniques in computation. By the year 1,600 they achieved their goal and established the arithmetic techniques which have remained in general use up to the present time.

Teaching Aid

The abacus was then placed in a semi-retired status, but this ancient device is finding its way back into the classrooms of today. Teachers are finding it a real aid in the teaching of place value, addition, and subtraction.

A significant goal of contemporary programs is to help children develop a wholesome attitude toward mathematics. Traditionally, many students regard mathematics with considerable distaste, but this is changing as children are learning that this subject can be exciting and interesting. They are given opportunities to be creative and develop original solutions to problems. They learn they can solve problems through their own efforts, instead of relying on rigid techniques or memorized rules.

More new mathematics has been created in the 20th century than in all previously recorded history. Entire fields of mathematics that used to be the exclusive domain of a few experts just a half a century or so ago are now being taught in high school; some are even beginning to enter the junior high school classrooms, thus making room at the upper end of the curriculum for some of the newer, contemporary mathematics that modern society demands of its productive citizens.

Aware that the people in tomorrow's society will have to compete with automation as well as with other people, the school programs of today endeavor to see that creative imagination and productive thinking are developed in each of the students to the limits of his capacities.

The modern mathematics program helps pupils learn to add, subtract, multiply and divide through the study of numbers and relationships that exist among numbers. Discovering patterns is a key activity in a modern program in arithmetic. A characteristic of the decimal numeral system that must be understood by the pupil is place value, and he must know that in our Hindu-Arabic system the value of a symbol depends upon the place it occupies. This is where the age-old abacus comes into the modern-day school picture. The operations of addition, subtraction, multiplication, and division must be experienced before they can be understood. The abacus board allows children to handle and see the processes for themselves.

Abacus Advantages

Advantages of the abacus are hardy construction, portability, and ease of operational methods, the latter a simplification of the four processes of arithmetic.

A peculiar advantage of the abacus is that a problem in addition and subtraction is worked from left to right, instead of right to left, as in the case with written arithmetic, and so harmonizes with the normal way of reading and writing numbers. One disadvantage is that the instrument produces only a final result without preserving a record of the intermediate steps. If an error is made, the whole calculation must be done again from beginning to end.

Don K. Miskovsky, teacher at Diablo Elementary School, has been giving his Sixth Grade pupils some pointers on how to use the abacus since he returned from military duty in Korea. It is used widely there and Miskovsky became fascinated with its use.

His students have become so proficient in using the oriental adding machine that they held a junior version of the Tokyo contest. The result was the same now as then: The abacus won.

CANAL COMMERCIAL TRAFFIC BY NATIONALITY OF VESSELS

Nationality	First half, fiscal year— 1969 No. of transits	1969 Tons of cargo	1968 No. of transits	1968 Tons of cargo	1961-65 Avg. No. transits	1961-65 Avg. tons of cargo
Belgian	60	73,007	54	148,864	21	77,724
British	719	6,001,715	738	5,950,994	632	4,124,334
Chilean	59	391,073	56	315,395	64	451,191
Chinese (Nat'l.)	68	503,756	51	386,850	41	301,600
Colombian	95	238,500	112	214,570	129	209,189
Cuban	24	244,460	15	156,314	2	5,369
Danish	209	1,184,859	238	1,236,995	154	725,383
Ecuadorean	28	34,251	73	70,676	24	27,366
Finnish	20	126,433	19	107,141	11	41,202
French	125	535,235	103	528,534	66	364,357
German	570	2,264,784	623	2,508,724	558	1,687,827
Greek	284	3,096,111	202	2,139,597	316	3,077,249
Honduran	119	75,433	99	60,694	105	80,942
Israeli	55	396,184	53	241,166	34	128,409
Italian	127	831,446	121	971,506	97	561,167
Japanese	551	4,622,648	513	3,835,187	433	2,542,668
Liberian	807	12,126,913	765	9,825,326	458	4,416,239
Mexican	58	196,778	25	45,887	12	29,179
Netherlands	230	1,165,276	204	900,514	294	1,346,865
Nicaraguan	29	56,461	39	62,413	28	41,772
Norwegian	678	7,106,639	763	8,177,184	695	5,078,587
Panamanian	313	1,347,241	244	1,321,944	221	959,816
Peruvian	93	413,628	85	427,079	58	296,697
Philippine	50	278,068	44	185,555	33	135,090
South Korean	22	183,792	13	45,775	4	24,027
Soviet	46	327,519	36	265,124	6	48,219
Swedish	254	1,698,578	219	1,367,393	181	1,026,269
Swiss	20	13,191	44	57,346	19	42,611
United States	839	4,386,105	822	4,343,733	877	5,259,746
All Others	154	1,162,988	133	1,037,823	58	307,060
Total	6,706	51,083,072	6,506	46,936,303	5,631	33,418,154

MONTHLY COMMERCIAL TRAFFIC AND TOLLS

Vessels of 300 tons net or over—(Fiscal years)

Month	Transits 1969	Transits 1968	Transits Avg. No. Transits 1961-65	Gross tolls* (Thousands of dollars) 1969	Gross tolls* 1968	Gross tolls* Average Tolls 1961-65
July	1,122	1,177	960	7,089	7,400	4,929
August	1,109	1,117	949	7,362	6,751	4,920
September	1,115	1,023	908	7,473	6,370	4,697
October	1,138	1,048	946	7,471	6,754	4,838
November	1,103	1,041	922	7,279	6,672	4,748
December	1,119	1,100	946	7,571	7,133	4,955
January		1,094	903		6,916	4,635
February		1,055	868		6,686	4,506
March		1,132	1,014		7,027	5,325
April		1,132	966		7,300	5,067
May		1,168	999		7,493	5,232
June		1,112	954		7,405	5,013
Totals for fiscal year		13,199	11,335		83,907	58,865

* Before deduction of any operating expenses.

TRAFFIC MOVEMENT OVER MAIN TRADE ROUTES

The following table shows the number of transits of large, commercial vessels (300 net tons or over) segregated into 8 main trade routes:

Trade routes	First half, fiscal year— 1969	1968	Avg. No. Transits 1961-65
United States Intercoastal	196	201	231
East coast United States and South America	765	762	1,208
East coast United States and Central America	353	299	241
East coast United States and Far East	1,655	1,470	1,133
East coast United States/Canada and Australasia	237	222	171
Europe and West coast United States/Canada	474	484	459
Europe and South America	616	680	592
Europe and Australasia	198	204	176
All other routes	2,212	2,184	1,420
Total traffic	6,706	6,506	5,631

Overland Shipping Watched

DESPITE EXTENSIVE discussion in shipping circles in the United States and Canada, the land-bridge concept of moving container cargo from coast to coast probably will never become serious competition for the Panama Canal, shipping experts believe.

The idea has been of interest locally since the publication recently of the Litton Systems Inc. report which predicted that a tie-in with railroads and ship operators might divert considerable traffic from the Panama Canal.

Canal spokesmen say that if the plan is successful, it would have some effect on Canal traffic which presently depends mostly on ships carrying bulk cargoes which cannot be containerized. Furthermore, with the continued growth of world trade, any diversion of cargoes through the land-bridge plan would be insignificant.

The whole land-bridge concept of moving container cargo by trains between the east and west coast ports in Canada and the United States is one of the results of the growth of containerization which, the Journal of Commerce of New York says, has taken over the "penthouse of the transportation edifice" in just 2 years since the concept was introduced on a major world trade route.

The container service operators still confront serious problems, but containerization as an operating concept appears well on its way to proving itself.

The Litton report forecast that by 1973, an estimated 23 percent of total U.S. liner cargoes would be traveling on containerships and by 1983, the average of 41.5 percent would be on containerships.

The future of the container concept of transporting cargo, just as the future of the land-bridge traffic across the North American continent, will depend on how much trade can be stimulated by making movement of goods easier, faster, and possibly cheaper.

Several railroads including the Canadian National Railroad, the Canadian Pacific Rail of Montreal, the Penn-

Central and the Santa Fe of the United States, have made proposals on the land-bridge movement of cargo across the United States and Canada and so far the results remain somewhat uncertain.

Details of the proposed land-bridge train between California ports and New York were revealed by John Reed, President of the Santa Fe Railroad. They called for an 80-car train capable of carrying 160 40-foot or 320 20-foot containers between New York and California ports on a schedule of approximately 5 days in each direction. Reed said that a similar service could be offered between California ports and Texas ports.

The Santa Fe would operate the train between California and Chicago and the Penn-Central between Chicago and New York.

The Canadian National Railroad said the extremely low transcontinental rail rate required to promote land-bridge traffic could be obtained only by using all-container trains.

The traffic required to justify all-container trains, however, need only be a volume sufficient to utilize one set of rail equipment. As the round-trip cycle time between Halifax and Vancouver, for example, would be approximately 2 weeks, 200 to 220 20-foot containers every 2 weeks could initiate the land-bridge scheme immediately.

A preliminary analysis made by the Federal Maritime Commission did show that this type of proposal, if used between ports in the United States from Japan through the west coast to the east coast consignee or from the United Kingdom through the east coast to the west coast consignee, might result in lower landed costs.

The report said "The savings in transit time in these movements to and from the east and west coast as compared to a movement via the Panama Canal are significant. A land-bridge movement from the west coast to the United Kingdom via the land-bridge takes 11 days. This represents a saving of 13 days over the all-water route with resultant economies such as those of a smaller inventory and lower warehousing and insurance charges."

In any case the future of containerization and the movement of cargo overland bears watching especially in view of the possibility that there may be an early end to the hostilities in Southeast Asia. This would add to overcapacity and would push the containerships now engaged in the Far East traffic into other trade routes.

PRINCIPAL COMMODITIES SHIPPED THROUGH THE CANAL

(All cargo figures in long tons)

Pacific to Atlantic

Commodity	First half, fiscal year— 1969	1968	5-Yr. Avg. 1961-65
Ores, various	2,146,711	2,333,031	519,996
Boards and planks	1,757,183	674,707	N.A.
Iron and steel plates, sheets and coils	1,590,737	449,826	N.A.
Sugar	1,513,091	1,508,080	1,235,175
Fishmeal	941,870	743,348	N.A.
Metals, various	677,888	655,592	566,481
Iron and steel manufactures, miscellaneous	599,006	1,027,070	N.A.
Food in refrigeration (excluding bananas)	595,417	584,308	394,842
Pulpwood	588,836	445,236	249,504
Bananas	571,631	621,336	565,876
Plywood and veneers	471,100	270,950	N.A.
Potash	367,554	227,752	17,035
Canned food products	350,309	400,763	517,232
Petroleum and products	320,674	972,583	1,024,347
Wire, bars and rods	292,302	72,579	N.A.
All others	5,213,004	5,930,655	9,792,781
Total	17,997,313	16,917,816	14,883,269

Atlantic to Pacific

Commodity	First half, fiscal year— 1969	1968	5-Yr. Avg. 1961-65
Petroleum and products	7,652,739	7,679,111	5,484,146
Coal and coke	6,940,886	5,594,979	2,925,019
Phosphates	2,649,308	1,903,848	1,046,645
Metal, scrap	1,647,713	1,970,588	1,527,264
Corn	1,515,820	1,090,297	636,706
Soybeans	1,477,776	1,221,905	735,645
Sorghum	1,113,801	667,075	N.A.
Ores, various	949,468	996,158	147,988
Metal, iron	791,536	1,572,123	100,447
Wheat	745,964	474,913	335,771
Sugar	529,297	529,853	516,556
Paper and paper products	445,800	348,310	225,987
Chemicals, unclassified	345,313	451,217	318,745
Rice	303,246	372,532	56,257
Autos, trucks and accessories	295,936	239,492	160,582
All others	5,680,156	4,906,086	4,317,127
Total	33,085,759	30,018,487	18,534,885

CANAL TRANSITS – COMMERCIAL AND U.S. GOVERNMENT

	First half, fiscal year— 1969 Atlantic to Pacific	1969 Pacific to Atlantic	1969 Total	1968 Total	Avg. No. Transits 1961-65 Total
Commercial vessels:					
Oceangoing	3,354	3,352	6,706	6,506	5,631
Small *	140	125	265	286	286
Total Commercial	3,494	3,477	6,971	6,792	5,917
U.S. Government Vessels: **					
Oceangoing	404	305	709	700	124
Small *	45	30	75	66	82
Total commercial and U.S. Government	3,943	3,812	7,755	7,558	6,123

* Vessels under 300 net tons or 500 displacement tons.

** Vessels on which tolls are credited. Prior to July 1, 1951, Government-operated ships transited free.

FROM WATERBOY TO SUPERMARKET KING

MENTION THE name Tagarópulos in Panama and most people immediately will think of supermarkets. The reason is simple: For 57 years it has been associated with the business of selling food.

Today the Tagarópulos enterprises have expanded to other fields, but supermarkets still are a substantial part of their business.

The man who made the Tagarópulos name a household word in the country's two terminal cities—Don Antonio Tagarópulos—still keeps busy at 76, overseeing the varied operations of the business organization he created from one small grocery store in Colon.

Employ 1,500

Seven separate firms with holdings valued at $6.5 million comprise the Tagarópulos organization today. Three are in the grocery business. Empresa Tagarópulos, S.A., Colon-Panama, handles the wholesale end, supplying the chain of 10 supermarkets in Panama City and one in Colon operated by La Economía, S.A. and Internacional Tagarópulos S.A., in the Colon Free Zone, which is the ship chandlering company. Then there are Industrias Tagarópulos, S.A., which operates a plant in Colon for the manufacture of products such as vanilla concentrate, cleaning solutions and soy sauce, Inmobiliaria Tagarópulos, S.A., in the real estate field; Urbanización Tagarópulos, S.A. which is developing a housing project in Sabanitas, near Colon, and Fábrica Panameña de Productos Sanitarios, S.A., which manufactures sanitary products.

The seven companies employ a total of 1,500 persons.

Other Interests

In addition to founding the Tagarópulos organization, Don Antonio also has played a leading role in the development of the bottling industry in Panama. Compañía Panamericana de Orange Crush, S.A., bottles Orange Crush, Pepsi Cola, Old Colony, and Squirt in its modern plant in Panama City.

He also was among the first to envision a free trade zone in Colon and as far back as 1938, when he was president of the Colon Chamber of Commerce, became one of its prime advocates. The Colon Free Zone is today a mainstay of economic activity in the country.

At one time he operated a fleet of 14 coastwise schooners that picked up native products along the Atlantic coast for export. There were "tagua," a hard nut used for the manufacture of buttons, tortoise shell and, of course, bananas. The advent of synthetics finished the "tagua" and tortoise shell exports; the banana business—which at its peak reached a volume of 150,000 stems a week—eventually died out on the Atlantic coast. While his boats operated, Don Antonio was dubbed the "commodore of the mosquito fleet" in the local press.

While Don Antonio won't even think of moving from Colon, the center of operations of the Tagarópulos organization inevitably has shifted to Panama City. Just last year, Empresa Tagarópulos, S.A., Colon-Panama, moved into its spacious new headquarters in La Locería, just off the Trans-Isthmian Highway opposite the National Brewery. The most impressive section is a cavernous warehouse with approximately 100,000 square feet of floor area. It includes five cold storage rooms for perishables of all kinds in which temperatures are maintained at precise levels. The warehouse, praised by Stateside visitors as one of the most modern in Latin America, has a capacity for 3,400 tons of goods.

Modest Start

All this had modest beginnings.

In a manner of speaking, the Tagarópulos enterprises owe their start to the Panama Canal. For Don Antonio, then a lad of 15, came to the Isthmus because in his native Greece he saw evidence of the wealth flowing on the Isthmus during Canal construction days.

It was the year 1908. Young Antonio and two cousins, then living in Chalkis, were impressed by the fact that an aunt always was supplied with money to buy them goodies. They knew her husband was in Panama and they suspected he was the source of her wealth. Their suspicions were confirmed by a letter which the trio managed to purloin from her.

From that moment they did not stop until they obtained parental consent—given reluctantly—for the trip to Panama.

Don Antonio Tagarópulos

That year the three cousins landed in what was to become the city of Colon, each with 7 napoleons—$35—in their pockets.

Young Antonio went to work with the Isthmian Canal Commission as a waterboy—hauling drinking water to the ditch diggers. His pay: 21 cents an hour.

Stays On

His cousins left the Isthmus for the United States within a few months, but young Antonio stuck it out. He had vowed to succeed or bust. Nine months after his arrival, he quit his job as waterboy and went to work in a bakery in Colon owned by a countryman. Another 9 months went by before he had managed to save $900—enough to open his own grocery shop.

This is part of the cavernous warehouse of Empresa Tagarópulos, S.A., Colon-Panama, just off the Transisthmian Highway opposite the National Brewery in Panama City. It has 100,000 square feet of floor area, five cold storage rooms and a capacity of 3,400 tons of goods.

Tagarópulos, center, founder of the Tagarópulos enterprises in Panama, reviews plans for a new supermarket with Alexander Psychoyos, right, president of Empresa Tagarópulos, S.A., Colon-Panama, and Azael Hernando, secretary of the board of directors, at the company headquarters in Panama City.

"I've always liked food," he says by way of explanation for his choice of business.

The shop was located in the present Colon Post Office building, then the public market. It had two employees besides young Antonio, the proprietor.

"Business was so good," Don Antonio recalls with a hearty laugh, "that we didn't count the money—we weighed it."

Then the first of three conflagrations in Colon wiped him out—"lock, stock, and barrel"—in 1915. But the day after the fire young Antonio was at what was left of his place of business, selling hard-boiled eggs, burnt salt and everything else he could salvage from his stock.

With the help of businessmen friends, he opened a new and larger grocery store, this time on Sixth Street.

"This was a much better one," he recalls fondly. "We didn't wrap things in old newspapers like we used to; we had decent paper."

That store, too, was wiped out by fire about 10 years later. But Don Antonio managed to make another start

(See p. 20)

"Ambition, Faith in God, Love of Work"

(Continued from p. 19)

and by 1940, when the third conflagration swept the Atlantic side city, he had a chain of nine grocery stores going in Colon. By that time, it was Tagarópulos, S.A., with two brothers and several brothers-in-law as the company officers and major stockholders. The 1940 fire caught the firm in the process of readjusting its insurance coverage, so that its losses were not covered. Practically the entire chain of stores went up in smoke. It took a while for the Tagarópulos organization to recover from that heavy blow, but recover it did to become the flourishing business complex it is today. Don Antonio went to Greece and returned with "fresh blood"—his three brothers-in-law—to reorganize the company, which then became Tagarópulos, S.A.

As he rose in business, Don Antonio extended his hand to the less fortunate.

"One must help his fellow beings," is his terse comment on his philanthropic activities. He is known to be among the principal supporters of the Asilo Santa Luisa, a home for the aged, and of projects for blind children. He is reticent about this aspect of his activities.

Official Honors

Nevertheless, he has received official recognition, from both his native and his adopted countries, for his achievements and contributions. Among others, he holds the Order of Vasco Núñez de Balboa, of Panama; Greece's Order of King Paul, which was personally presented by the sovereign, and the Christian Stewardship of the Greek Orthodox Archdiocese of North and South America.

At 76, a grandfather six times, Don Antonio remains active in the business. He goes every morning to his office in Colon and periodically travels to Panama City to keep in touch with operations of the Tagarópulos firms in the capital. Whenever possible, he spends the afternoons on his farm near Colon where he is raising both beef and dairy cattle.

Surprise

Twice since 1908 he has returned to his native Greece on extended visits. On his second trip, he discovered a savings account in his name in a Greek bank. It had been started by his father with $25,000 Don Antonio had sent him earlier as a gift. The account had grown to $35,000 because of the accumulated interest.

Sixty years after his arrival in Panama, Don Antonio abides firmly by the creed that kept him going in misfortune and drove him to become a captain of industry in Panama—"ambition, faith in God, and love of work."

The Tagarópulos enterprises employ 1,500 persons in Panama City and Colon. This is part of the office staff at the organization's headquarters. Tagarópulos, standing left, who resides in Colon where he started in business, periodically visits the Panama City office.

SHIPPING

Super Tanker

ANOTHER MONSTER ship that will be unable to use either the Panama or Suez Canal was completed in Japan recently and christened the *Universe Ireland* by Gulf Oil Corp. The 312,000-ton ship will be the first of six which will carry crude oil from Kuwait, the tiny Middle East country with the big oil reserves, to new refineries in Ireland and Okinawa.

The *Universe Ireland* is 1,135 feet long and 174 feet wide. She is 10 stories high and on each trip will haul 2.3 million barrels of oil. Gulf is chartering the big vessel on a long-term basis from Bantry Transportation Co., a Bermuda subsidiary of National Bulk Carriers Inc., an American firm.

Caronia on New Service

THE FORMER Cunard luxury liner *Caronia*, which was sold recently to Greek interests under the management of A. Constantinides, has been fitted out for Caribbean cruising. She started her new service in December, sailing on a regular schedule from New York to the Caribbean on high-class pleasure cruises. The crew is Italian and Greek and the commanding officer is a former British admiral.

Under Cunard ownership the *Caronia* was one of the first of the luxury cruise liners. She was built for round-the-world cruising and made regular trips through the Panama Canal for many years.

Swedish Ships Converted

BY MAY 1969 all five of the Swedish Johnson Line vessels of the Rio de Janeiro class which transit the Panama Canal on an average of one a month, will be lengthened to provide special facilities for transportation of containers. The vessels are in trade between European ports and the west coast of the United States and Canada. The conversion is being carried out in Gothenburg, Sweden.

Each of the five 490-foot vessels is being cut about midships to permit the insertion of a 79-foot section. The new midships section, prefabricated at the shipyard prior to the arrival of each ship, will be equipped to carry 90 20-foot containers. A high speed Asea deck crane with a capacity of 25 tons also is being installed.

The deadweight capacity of each vessel is being increased from 8,980 tons to 12,000 tons and the cubic capacity from 496,000 to 650,000 cubic feet. All will retain their present speed of 19½ knots after conversion.

The first conversion was started in August and each lengthening operation is taking approximately 30 days. The ships are the MS *Montevideo*, MS *Brasilia*, MS *Bahia Blanca*, MS *Rosario* and MS *Santos*.

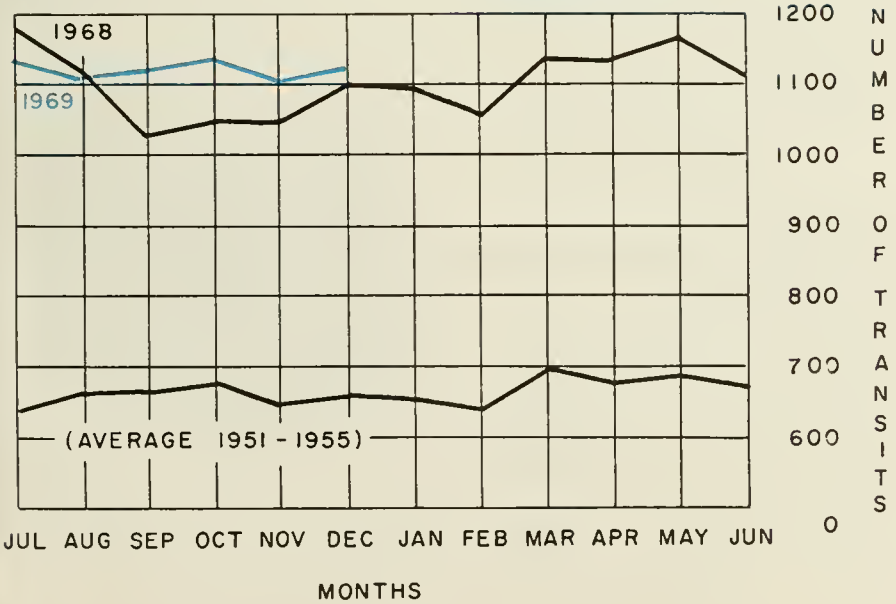
The Johnson Line was established in 1914 following the opening of the Panama Canal to provide service between Scandinavia and the U.S. west coast and Canada. Today it operates 40 cargo vessels, including 5 fully refrigerated vessels. The line also provides regular service from Scandinavian and continental ports to Central and South America. The Central American service was joined recently with the Mamenic Line of Nicaragua.

PANAMA CANAL TRAFFIC
STATISTICS FOR FIRST HALF OF FISCAL YEAR 1969

TRANSITS (Oceangoing Vessels)	1969	1968
Commercial	6,706	6,506
U.S. Government	709	700
Free	33	55
Total	7,448	7,261
TOLLS*		
Commercial	$44,262,476	$41,098,630
U.S. Government	4,471,272	4,339,125
Total	$48,733,748	$45,437,755
CARGO**		
Commercial	51,083,072	46,936,303
U.S. Government	4,167,389	4,133,583
Free	57,360	274,526
Total	55,307,821	51,344,412

* Includes tolls on all vessels, oceangoing and small.

** Cargo figures are in long tons on all vessels, oceangoing and small.



New Lykes Cargo Carriers

LYKES BROS. SS. Company Inc. of New Orleans, which operates a fleet of cargo ships through the Panama Canal, has contracted for the construction of three of the worlds largest cargo transports of a revolutionary design. They will be built at the Quincy, Mass., shipyard of General Dynamics Corp. at a cost of $32,617,333 each. The ships are scheduled to enter service in 1971.

According to the announcement printed in SHIPPING DIGEST, each ship will be 875 feet long and 106 feet wide, making them the largest common carrier freight ships ever built anywhere in the world. They will be able to transit the Panama Canal.

Not only will these ships be big and powerful but they will represent a new concept in ocean cargo transportation. They also will provide the U.S. Navy forces with vital auxiliary power as assault ships, capable of carrying and handling helicopters and transporting landing craft as well as vehicles.

Elkhorn in foreground, brain coral, right, sea fans and a cluster of staghorns make up this underwater garden.

Coral is Jewel of the Sea

(Continued from p. 5)

Panama) and the dredge dumps near the Canal.

Corals have been living in this area for the past 50 or 60 million years. The The natural bridge on the Rio Puente, one of the tributaries of Madden Lake, is formed by an Eocene coral reef approximately 45 million years old. Additional reefs of early Miocene age (approximately 25 million years ago) were formed along the banks of the present Canal and can be seen in the sides of the new cuts at Las Cascadas Hill, site of the present cut-widening project.

Different species of coral adapt to different sections of the reef and the conglomeration of the many varieties creates a seascape of spectacular beauty. The combination of soft and hard corals and their helter-skelter positioning, plus the seaweed, sand and rock, produces a multitude of coves, crevices, gaps, nooks and corners providing a haven for thousands of tiny brightly colored fishes and some not so tiny, like 30 and 40-pound red snappers, groupers, jewfish, amberjack, and tuna.

Marine Community

Divers are sure to find at least one vicious-looking moray eel lurking among the rocks. Turtles, shrimp, snails, crabs and hundreds of other marine organisms, in red, orange, purple, green —bright and muted—inhabit this glorious coral limestone community in the aqua sea. Sharks and barracudas may swish by in search of prey. The mere possibility of their presence in the vicinity of the coral reef is reason enough for the diver to keep a sharp lookout for the boat above.

Reef corals, most of which are sharp as a knife, are firmly attached to the formation and collectors are required to use a strong prying or hacking tool to break them off. Some Isthmian coral collectors, like Mrs. Harrison, find that a machete does the job quite well.

Bad Odor

While still in the water, corals are greyish, brown, green or yellowish in color and have a rather disagreeable odor. The polyps die soon after the coral is taken from the water. About 1 month of good, strong sun is required to get rid of the offensive odor after the corals have been washed in fresh clean water and dried. Some collectors prefer to first keep the corals in a solution of commercial laundry bleach for 24 hours.

By either method the result is beautiful white corals—jewels from the flower garden in the sea.

ROTC RATES HIGH IN ENTHUSIASM

(Continued from p. 8)

(Rough Riders). It made its first public appearance at the December 13, 1968, brigade review which honored Gen. Robert W. Porter, Jr., Commander-in-Chief, U.S. Southern Command. If the troop becomes permanent, it will present equestrian demonstrations at the cadet reviews.

ROTC cadets also appear at community functions, acting as ushers at official receptions, at athletic events, and participating in observances such as Memorial Day and Veterans Day.

Main Reasons

"The thing that makes my job easy," says Major Fisher, a two-tour veteran of Vietnam, "is the very high enthusiasm of the students themselves. Their attitude and performance are the primary reasons why the ROTC program has been so very successful here."

Right now, cadets of both battalions have their eyes set on April 17. That's the date for the 1969 inspection that will determine whether they will add another Honor Unit designation to their already distinguished record.

CANAL HISTORY

50 Years Ago

THEODORE ROOSEVELT, in whose presidential administration the United States began work on the Panama Canal, died at his home at Oyster Bay, Long Island, 50 years ago in January 1919. The employees of the Panama Canal sent the family their deep sympathy. Memorial services were held on both sides of the Isthmus attended by Acting Governor W. J. Douglas, Frank Feuille, Special Attorney for the Panama Canal, and William J. Price, U.S. Minister to Panama.

As World War I came to an end 50 years ago, the complete text of Gov. Chester Harding's report to the Secretary of War on the part played by the Panama Canal in the conflict was published in the Panama Canal Record. The Governor reported the Canal was operated and maintained during the period of the war without mishap or delay to vessels using its facilities; that no acts of injury or destruction were committed and that there were no strikes or other significant labor troubles.

25 Years Ago

SELECTIVE SERVICE registration in the Canal Zone and in Panama of U.S. citizens 18 to 44 years old was completed. The number of C.Z. registrants as of December 1, 1943, totaled 2,744 according to the Executive Secretary's report.

Black days were ahead for Canal Zone motorists 25 years ago unless the tires on their cars could be recapped since the chance of obtaining new tires was very remote, said E. C. Lombard, then Chairman of the Canal Zone Rationing Board. The quota of new tires alloted to the Canal Zone had been cut by two-thirds.

Allied victories and the changing fronts of World War II made themselves felt on the Isthmus. The Canal, the most vital link in U.S. communications, gradually moved into the background in the overall war picture. In December 1941, the Isthmian situation had been described as precarious. For the first few days, no one knew whether an attack on the Canal would follow the raid on Pearl Harbor. At the end of 1943, no sirens had sounded in the Zone for the whole year although there was a full scale serious alert October 29 after reports of possible trouble along the Central American coast. Only one serious situation arose to menace the security of the Canal as a line of communication. This was increased activity of enemy submarines in the Caribbean. At the end of the year a Colombian schooner and two U.S. vessels were sunk and a Panamanian ship was reported overdue.

A storm described as a norther closed the new Transisthmian Highway to traffic 15 miles east of Madden Dam. At one time more than 200 cars lined up waiting for the road to be cleared. During the storm a U.S. merchant ship ran aground off Cristobal.

10 Years Ago

THE BIGGEST single excavation job in the Canal Zone since the Canal was opened was ready to start 10 years ago in January. The job was the widening of the channel in the Paraiso and Cucaracha Reaches in Gaillard Cut from 300 feet to 500 feet. It was one of the principal projects of the Short Range Improvement Plan developed and approved by the Board of Directors the previous year.

Bids for the remodeling of three large former Navy barracks into a first-class modern school plant were advertised in mid-December 1958. The school became the new Cristobal Junior-Senior High School.

The largest single job in the project to place all frequency-sensitive equipment in the Canal Zone on 60-cycle power—the conversion of the Canal locks machinery—was started in December 1958. The work was done by Consolidated International Electric Company of New York at a cost of $2 million.

Construction of the half-mile-long approach to join the proposed high level bridge over the Canal with Thatcher Highway, began during the dry season months 10 years ago. The official commencement of actual construction of the bridge took place the last of December when former President Ernesto de la Guardia and Former Governor W. E. Potter lifted the first spadesful of earth for the west approach. Members of the President's cabinet and other distinguished guests from Panama and the Canal Zone attended.

One Year Ago

LOCKS OVERHAUL in progress at Gatun Locks 1 year ago moved into the second phase the last of February with the east lane being flooded to permit the floating crane *Hercules* to enter and replace miter gates Nos. 13 and 14 on which overhaul had been completed. Miter gates 5 and 6 were removed the following week and set on keel blocks within the locks chambers for overhaul.

The Panama Canal asked residents to cut use of electricity. Continuing dry weather had reduced water inflow into Gatun Lake to a record low in January and by February, it was imperative that water conservation policies be continued. Canal residents helped by using large electric appliances prior to 10 a.m. and after 2 p.m. thus reducing the midday peak load.

New 10-cent and 25-cent airmail and 6-cent ordinary postage stamps were placed on sale at the Balboa Post Office last year.

ANNIVERSARIES

(Continued from p. 12)

Eloy Arrocha
Oiler

Carlos Hinojozo
Maintenanceman (Boats)

Albert E. Johnson
Motor Launch Operator

Juan D. López
Seaman

Samuel B. Goode
Painter

Alsibades Escobar
Seaman

CIVIL AFFAIRS BUREAU

Louis A. Austin
Distribution and Window Clerk

William W. E. Hoyle
Supervisory Customs Inspector

Ben B. Gupton
Customs Enforcement Officer

Alfhild Maedl
Teacher, Elementary U.S. Schools

Carl F. Maedl
Principal, Senior High Schools

Clinton L. Parris
Recreation Assistant, Sports

HEALTH BUREAU

Cynthia S. Soberanis
Nursing Assistant

Ruby E. Radel
Supervisory Clinical Nurse

Date Due

Due	Returned	Due	Returned
JAN 2 1 1991	JAN 3 0 1995		
AUG 2 6 1991	AUG 0 2 1991		

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